

CONSULTATIONS AND WORKSHOPS

Food Safety Strategic Planning Meeting

Report of a WHO Strategic Planning Meeting

**WHO Headquarters, Geneva, Switzerland
20–22 February 2001**



**FOOD SAFETY PROGRAMME
DEPARTMENT OF PROTECTION OF THE HUMAN ENVIRONMENT
WORLD HEALTH ORGANIZATION**

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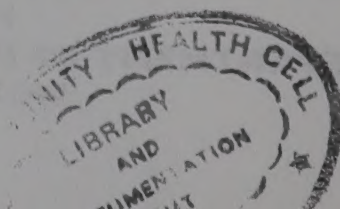
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CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION	1
2. BACKGROUND.....	1
3. OBJECTIVES OF THE CONSULTATION.....	2
4. OVERVIEW OF THE WORKING PAPERS AND DISCUSSIONS	2
4.1 MICROBIOLOGICAL HAZARDS ASSOCIATED WITH FOODS.....	2
4.2 SURVEILLANCE OF FOODBORNE DISEASE	6
4.3 CHEMICAL HAZARDS ASSOCIATED WITH FOODS	8
4.4 BIOTECHNOLOGY AND ITS APPLICATION TO FOODS.....	11
4.5 REGULATING FOOD SAFETY	14
4.6 RISK COMMUNICATION.....	16
4.7 DEVELOPING FOOD SAFETY CAPACITY.....	19
5. CONCLUSIONS AND RECOMMENDATIONS.....	22
5.1 FOSTERING IMPROVEMENTS IN FOOD SAFETY	22
5.2 SCIENTIFIC NEEDS	24
5.3 IMPLEMENTATION OF CHANGE.....	25
5.4 RISK COMMUNICATION AND STAKEHOLDER INVOLVEMENT	26
<u>LIST OF ABBREVIATIONS</u>	28
<u>ANNEX 1: LIST OF PARTICIPANTS</u>	29

CONTENTS

EXECUTIVE SUMMARY

1. INTRODUCTION	1
2. BACKGROUND	2
3. OBJECTIVES OF THE COMPARISON	3
4. OVERVIEW OF THE RESEARCH DESIGN AND PROCEDURES	4

4.1. Research Design	4
4.2. Sampling	5
4.3. Data Collection	6
4.4. Data Management and Analysis	7
4.5. Research Instruments	8
4.6. Ethical Considerations	9
4.7. Limitations of the Study	10

5. CONCLUSIONS AND RECOMMENDATIONS	11
5.1. Conclusions	11
5.2. Recommendations	12
5.3. Implications for Practice	13
5.4. The Researcher's Contribution	14

LIST OF ABBREVIATIONS

APPENDIX 1: LIST OF PARTICIPANTS

APPENDIX 1: LIST OF PARTICIPANTS	15
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EXECUTIVE SUMMARY

Global trends including changing practices in agriculture, increased urbanization, changing food consumption patterns, increasingly susceptible populations, and the globalization of food trade seem to have contributed to the increased risk of foodborne disease at local, national, and international level over recent decades. This increase in food safety risks and its impact on public health demand new approaches to address these risks at both international and Member State level.

In May 2000, the World Health Assembly recognized food safety as a priority area. It adopted a resolution confirming food safety as an essential public health function, and requested the Director-General to convene a Strategic Planning Meeting of food safety experts. The objective of the meeting was to stimulate debate on food safety, and to provide the WHO Food Safety Programme with advice on global food safety issues.

The Strategic Planning Meeting addressed microbiological and chemical hazards in food, surveillance of foodborne disease, the transfer of new technologies, food regulations, risk communication, and capacity building; and drafted comments to be considered in the development of a new WHO Food Safety Strategy.

The Meeting recognised that public trust and confidence placed in WHO by the global community positioned WHO as the leader in public health matters associated with global food safety.

The risk analysis framework was seen as the appropriate approach for the identification of food safety risks and the prioritization of activities, at a national and international level, designed to reduce foodborne illness.

The Meeting recognized the need for improved cooperation between international agencies involved in food safety to eliminate duplication of effort and make better use of available resources to reduce foodborne disease. Similarly, it recognized the need to develop better linkages between national agencies in Member States, to establish and improve the implementation of effective food safety programmes.

The Meeting identified the need to develop or upgrade food safety systems, especially in the developing countries in order to facilitate reduction of foodborne disease. Activities that build national food control capacity were seen as a priority for Member States and WHO.

Effective participation by Member States, especially developing countries, in the international standards setting process was regarded as an appropriate mechanism for raising the basic level of food safety globally.

The Meeting made a number of recommendations that addressed specific issues, including microbiological and chemical food safety, risk analysis, foodborne disease surveillance, regulatory mechanisms, and capacity building that would contribute towards strategies aimed at reducing foodborne disease.

This Strategic Planning Meeting represented a component of a broad consultative process undertaken by the Food Safety Programme, which would ultimately result in the development of a **Global WHO Food Safety Strategy**.

EXECUTIVE SUMMARY

Global health security requires a multi-sectoral approach involving governments, the private sector, academia, and the public. The WHO is leading the effort to build a global health security framework that will enable countries to prevent, detect, and respond to health threats. This framework is being developed through a series of consultations and workshops, with the goal of creating a global health security framework that will enable countries to prevent, detect, and respond to health threats.

In May 2019, the WHO held a meeting in Geneva to discuss the progress of the global health security framework. The meeting was attended by representatives from 150 countries, as well as the private sector, academia, and the public. The meeting was a success, and it was agreed that the global health security framework will be developed through a series of consultations and workshops, with the goal of creating a global health security framework that will enable countries to prevent, detect, and respond to health threats.

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1. INTRODUCTION

A Strategic Planning Meeting on food safety was held at the headquarters of the World Health Organization (WHO) in Geneva from 20-22 February 2001. Fifteen members as well as representatives of observer organizations and the authors of discussion papers participated in the Consultation. The complete list of participants is attached in Annex 1.

Ms Ann Kern, Executive Director, Cluster of Sustainable Development and Healthy Environments, opened the consultation on behalf of the Director General of WHO, Dr Gro Harlem Brundtland.

Ms Kern highlighted the need to raise the awareness of decision-makers of the importance of food safety, in terms of its impact on public health. The absence of effective food safety systems to prevent or control food safety problems has a negative impact on health, productivity and trade and is to the detriment of sustainable development. This is particularly significant in developing countries.

Increasing globalization of trade in food is stimulating the development of international standards for food. Although developed countries are capable of effective participation in the international standard setting process, less developed countries require assistance. The major impediments to effective participation in this process include a lack of resources, the absence of adequate food safety control systems, and limited foodborne disease surveillance and food monitoring data.

The consultation elected Dr Jaap Jansen as Chairperson and Dr Maria Cecilia Figueiredo Toledo as Vice-Chairperson. Dr Robert Mitchell was elected as Rapporteur.

2. BACKGROUND

In May 2000, the World Health Assembly (WHA) recognized food safety as a priority area for WHO and identified future areas of work on food safety. This reflected global concerns about food safety and its significance as an essential public health function. The specific directions for food safety activities were outlined in World Health Assembly Resolution WHA 53.15, and included a request for the Director General to convene a strategic planning meeting, involving food safety experts, to assist in the development of a *WHO Strategy on Food Safety*. This strategic planning meeting represented only one aspect of a broad consultative process undertaken by the Food Safety Programme, which will ultimately lead to the preparation of the WHO Strategy on Food Safety.

The current food safety situation is one in which a limited number of countries have food safety systems that are more or less integrated throughout the food chain, focusing on risk prevention, corrective action and enforcement. Other countries are lacking such systems because of limited coverage of the food chain or outdated controls based on more traditional approaches. In most countries, however, the incidence of foodborne disease, especially that caused by microbiological hazards, seems to have increased. The food safety systems of all countries are facing new challenges, in particular potential hazards arising from new technologies, globalization of food trade, and use of antimicrobials. Underpinning this situation is an increasing recognition that food is not always safe (risk-free) in absolute terms, hence the need to address these risks by implementing a risk-based approach.

The meeting focused on seven priority areas identified by the Food Safety Programme. Details of the priority areas were outlined in a Working Paper prepared for participants in the Food Safety Strategic Planning Meeting. The paper addressed contemporary food safety issues and identified trends that may become apparent in the medium to long term.

3. OBJECTIVES OF THE CONSULTATION

The Terms of Reference for the Strategic Planning Meeting were to provide the WHO Food Safety Programme with strategic advice on global food safety issues. This information will contribute to the development of a *WHO Global Food Safety Strategy*.

The meeting addressed three broad areas:

- Provision of advice on the future major issues in food safety and the strategic needs that these may entail.
- Review of the current food safety focus of WHO and provision of advice on activities which will complement or improve the outputs (including the work of the following programmes: Food Safety; Nutrition for Health and Development; Promotion of Chemical Safety; Animal and Food Related Public Health; Communicable Disease Surveillance and Response; and Water Sanitation and Health as well as WHO Regional Offices); and
- Consideration of other food safety strategies, especially in relation to those of the Codex Alimentarius Commission and the Food and Agriculture Organization of the United Nations (FAO).

4. OVERVIEW OF THE WORKING PAPERS AND DISCUSSIONS

The meeting sought to evaluate contemporary and future trends in food safety, and identify global strategies to improve food safety. Participants were provided with a Background Paper which provided details of the current WHO Food Safety Programme and provided the context of the meeting. Seven priority areas in food safety were identified in the Background Paper, and WHO appointed Temporary Advisors to prepare working papers for each priority area and to present this material at the meeting.

The participants discussed the main issues raised under each priority area. The principal matters raised during discussions and a summary of findings for each priority area are outlined below.

4.1 Microbiological Hazards Associated with Foods

4.1.1 Synopsis of Issues Presented

Microbiological foodborne illness is a growing public health problem in spite of major advances in science and technology and unprecedented efforts to control and manage the risk. Factors affecting the microbiological safety of food are changing dramatically e.g. new technologies, global movement of food, changing consumption patterns. Formal studies are

still needed to elucidate the role of recognized pathogens in foodborne diseases and to provide evidence about the nature and actual occurrence of new or emerging pathogens. Furthermore, enhanced surveillance of foodborne diseases and improved epidemiological studies will contribute to a better understanding of their etiology.

An improved global organization for addressing food safety issues is necessary in order to reduce the vulnerability of food production and distribution systems. Strategies and international standardization are needed to ensure adequate, consistent and effective design and implementation of preventive or protective technical solutions e.g. good manufacturing practices, good hygienic practices and the Hazard Analysis and Critical Control Point System (HACCP). There is also the need to act concurrently on the scientific, technological and societal determinants of microbiological food safety risks through a series of activities that include knowledge improvement, capacity building, hazard containment and reduction, confidence building, and emergency management. In this regard, WHO can provide a leadership role to effect change by facilitating international dialogue and communication on these issues, and promote international coordination and cooperation, with support from relevant international organizations such as FAO.

A risk-based approach is necessary to promote rational approaches for dealing with microbiological food safety issues. While much has been achieved in this regard under the aegis of FAO and WHO, much more is needed. These achievements should be consolidated by an appropriate follow-up of present interventions, including completion of ongoing risk assessments, further development of risk assessment methodology, identification of support actions, and provision of scientific advice.

Microbiological risk assessments have already been initiated at the international level. The 32nd meeting (1999) of Codex Committee on Food Hygiene (CCFH) prioritized the pathogen-commodity combinations of greatest concern and requested WHO and FAO to establish a mechanism to conduct expert consultations to advise on matters related to microbiological risk assessment. In response, WHO and FAO initiated a programme of work to provide scientific advice on pathogens of concern to the CCFH (*Salmonella* in poultry, *Salmonella enteritidis* in eggs and *Listeria monocytogenes* in ready to eat foods). These risk assessments will be completed and delivered to the CCFH in 2001. In 2000, WHO and FAO initiated two further risk assessments on *Vibrio parahaemolyticus*, *Vibrio vulnificus* and *Vibrio cholerae* in different types of fish and *Campylobacter* in poultry.

The discussion highlighted the risk manager's need for a baseline measure of acceptable microbiological risk, similar to the Acceptable Daily Intake (ADI) or Provisional Tolerable Weekly Intake (PTWI), which have been successfully applied in chemical hazard assessment. Such reference measures assist the risk manager to determine if action is needed to lower risk. It was suggested that a modular approach to risk assessment of microbiological hazards might be helpful. Three types of modules are envisioned (database modules, validation/optimization modules, and analysis modules). A module for a particular pathogen commodity combination could be adapted to the specific situation within an individual country.

Analysis of the present situation indicates there is still a need to enhance the utility of international risk assessment outputs. This can be accomplished by improving the adaptability of the work of the Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment (JEMRA) so the results may be more easily applied to diverse national situations. Specific consideration should be given to ensuring risk assessment technology transfer through a more modular approach, using support tools that facilitate practical implementation. Also, assistance needs to be provided to countries in the development of skills and competencies through operational networks of microbiological risk assessors, preparation of guidelines, and teaching and training programmes. The activities of the

JEMRA need to be established on a more formal, transparent, and permanent basis to guide and coordinate the risk assessment work and to foster international advancement of microbiological risk assessment.

4.1.2 Issues Identified during Discussion

Risk analysis (comprising risk assessment, risk management, and risk communication) is a recognized tool to determine priorities for managing the risk of chemical hazards in food, and its application to microbiological hazards in food is gaining momentum. Currently, microbiological risk assessment is considered to be a useful approach to organize information and identify gaps in knowledge and infrastructure. However, there must be clarity about the concept of risk, and the way to measure and express risk. It should be realized that evaluating different microbiological risks may require different strategies, and that an important way to use risk assessment is in the establishment of risk management options.

Bias must be excluded from the process of risk assessment if the results are to be considered credible. WHO and FAO have recently taken measures to help minimize bias in the process. Experts engaged in risk assessment activities are required to sign conflict of interest statements and disclose all affiliations and sources of income that may constitute a real or perceived conflict of interest. However, experts may have an inherent bias due to their background and previous field of work. In order to minimize this source of bias, FAO and WHO attempt to ensure a variety of viewpoints and backgrounds of the participants in expert consultations and expert advisory bodies such as the Joint FAO/WHO Expert Meeting on Pesticide Residues (JMPR), the Joint FAO/WHO Expert Committee on Food Additives (JECFA), and JEMRA. Consumers, producers, and industry are stakeholders in risk assessment and their viewpoints should be included in the process. WHO and FAO should also strive for a regional and gender balance among the participants.

The choice of a safety standard is a risk management function and should be taken up primarily in Codex. Such a standard should strive for continuous improvement, especially as different levels of risk are associated with different food products. When a certain level of risk is accepted there should be ongoing attempts to lower this acceptable risk, where this level is seen as being too high.

The World Trade Organization (WTO) Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) specifies Appropriate Level of Protection (ALOP) as a national reference measure. Public health protection goals are key elements of a risk-based approach. ALOP is specific to a country because countries establish the level of risk that they find acceptable.

Risk may need to be measured separately for the most vulnerable sub-populations: children, pregnant women, immuno-compromised persons and the elderly. The maximum permissible level may vary by sub-populations and risk management measures should address all affected populations.

Microbiological risk assessment is confounded by the lack of a baseline (or bright line) above which risk is deemed unacceptable. It is increasingly recognized that food is not always safe (risk free) in absolute terms. Zero tolerance for risk is at the moment not an achievable goal in the management of all microbiological hazards, considering the fact that even a single cell of a pathogen has some probability of causing illness under certain circumstances. A specific level is also complicated by the ability of microorganisms to rapidly proliferate under certain environmental conditions. However, this does not apply to toxigenic microorganisms, where a minimum number of organisms need to be present before sufficient toxin may be formed.

Microbiological risk assessment is time and resource intensive and may not be necessary in all cases requiring risk mitigation. Thus it should be tailored to the purpose and available capability. Moreover, exposure to microbiological hazards varies significantly by geographical region. Where sufficient capacity is available, microbiological risk assessment may be very useful to determine risk management priorities. Data to conduct microbiological risk assessment is not available in many countries, mainly because of limited funding in this area, but also in some cases because there is no infrastructure or technical expertise to generate such data. International cooperation in the exchange of data, will avoid duplication of scientific effort.

Developing countries in particular depend heavily on income from the export of food commodities. However these countries possess the least capacity to manage microbiological risks in food, and to conduct microbiological risk assessment in accordance with the SPS Agreement. Countries with expertise in microbiological risk assessment could assist and mentor developing countries to undertake these studies, and concomitantly build basic hygienic infrastructure and resources.

A key provision of the SPS Agreement is that when disputes among trading partners arise because of conflicting views about the safety of a food product and there are no international standards, or their measures deviate from the existing ones, the countries are expected to provide risk assessments to help identify whether the risks faced by consumers are significant or if the levels of assurance required from the exporting country are greater than those mandated by the importing country for its equivalent domestic industry. The SPS Agreement cites Codex standards, guidelines and recommendations as the reference international measures for facilitating international trade in food.

4.1.3 Summary of Findings

WHO should promote an understanding of the burden of microbial foodborne disease in all parts of the world, as well as assist in enhancing the ability of current food control systems to lower such risk significantly. In doing so the link between disease data and food contamination data needs to be strengthened. New considerations that provide efficient and coherent control from farm-to-table¹ need to be introduced, and priorities have to be discussed at national, regional and international level.

Risk analysis, including risk assessment, risk management, and risk communication, is the best way to determine priorities for the management of risk from microbiological hazards in food. WHO should continue to work with FAO on microbiological risk assessment through joint expert consultations that address issues on a priority basis. While risk assessment is not always necessary or possible, risk management options should still be established, especially when food safety risks are clear or risk management options are readily available.

WHO should pursue a modular approach to microbiological risk assessment. These modules should be adaptable to individual needs of member countries in conducting risk assessment for the management of foodborne illness.

There was consideration of whether WHO should continue work to formalize and expand the discussion on reference methods for establishing tolerable or acceptable microbiological risk levels. WHO should introduce clear descriptions of the principle of lowering risk in relation to microbiological food safety risk management activities.

¹ **Farm-to-table** - Term used to describe the food supply chain from the food production stage through to the consumer. Also referred to as farm-to-plate, farm-to-fork, hook-to-cook, etc. The food production stage includes all on-farm activities such as use of animal feeds, fertilizers, pesticides, etc.

WHO should ensure that prioritizing of pathogen-commodity combinations for microbiological risk assessment, at the international level, takes into consideration the burden of disease for consumers and more importantly for at risk populations in developing and developed nations.

4.2 Surveillance of Foodborne Disease

4.2.1 Synopsis of Issues Presented

Public health surveillance is *the ongoing and systematic collection, analysis, and interpretation of health data in the process of describing and monitoring a health event*. Public health surveillance data is used for planning, implementing and evaluating public health interventions and programmes, determining the need for public health action, and assessing the effectiveness of programmes. Surveillance must not be limited to collection of data, it must involve the analysis and interpretation of data, and its use for decision-making. When such surveillance is conducted, deviations are detected and commonly result in epidemiological investigations that lead to preventive measures. After prevention measures have been implemented, public health surveillance may be conducted to measure the effectiveness of such prevention measures.

Foodborne disease surveillance need not be limited to collection of human illness data. Food safety surveillance may include collection of data throughout the chain-of-events from the source of contamination to its human health consequences. Such surveillance may include data concerning animal feed, animal health (on farm and at time of slaughter), food (at processing plants, during distribution, and at retail level), consumer food behaviours (food preferences, preparation, and handling), and human illness (foodborne disease sequelae). Collecting and collating such data will result in robust surveillance and contribute to the development of focused and appropriate public health interventions.

There are a variety of foodborne disease surveillance systems including laboratory-based and epidemiological-based surveillance. Building capacity for public health laboratories to conduct laboratory-based foodborne disease surveillance, and epidemiologists to conduct epidemiological-based surveillance are important global public health objectives. Global Salm-Surv is a WHO initiative to build laboratory capacity to conduct laboratory-based surveillance. The success and momentum enjoyed by Global Salm-Surv demonstrates the utility of WHO leadership in coordinating international collaboration. It is anticipated that epidemiology networks may be created in WHO regions to facilitate building of epidemiological capacity, and WHO coordination of these regional networks is essential. Furthermore, special epidemiological-based surveillance efforts may also be introduced, including sentinel site surveillance to determine the burden of foodborne diseases.

At the global level, leadership by WHO is essential for coordinating and facilitating foodborne disease surveillance, and this is clearly demonstrated by Global Salm-Surv. Because foodborne disease surveillance and response is a core public health activity, efforts should be undertaken to build the laboratory and epidemiology capacity of Member States. Furthermore, WHO leadership is needed to develop a global strategy for foodborne disease surveillance. With the emergence of several international laboratory and epidemiological networks, now would be an opportune time for WHO to facilitate the development of such a strategy. This was recognized by the 53rd World Health Assembly, which stated that '*WHO should put in place a global strategy for the surveillance of foodborne diseases*'. To undertake this critical coordinating role, WHO will need to commit additional staff resources to foodborne disease surveillance.

4.2.2 Issues Identified during Discussion

Foodborne disease surveillance is essential for:

- Estimating the burden of foodborne diseases (health, economic, etc);
- Identifying priorities and setting policy in the control of foodborne diseases;
- Detecting, controlling, and preventing foodborne disease outbreaks;
- Identifying the need for and conducting microbial risk assessment;
- Identifying emerging food safety issues; and
- Evaluating the effectiveness of foodborne disease prevention and control strategies, including risk management strategies.

Data and information from foodborne disease surveillance systems may be utilized by microbiologists, clinicians, epidemiologists, food control authorities, and other interested parties, and should support the development of evidence-based disease prevention and control programmes.

Inter-sectoral and inter-institutional collaboration is of paramount importance, and foodborne disease surveillance should be integrated with food monitoring data along the entire food chain. Historically, this has not been the case and an important part of any future strategy should involve the creation of effective linkages between sectors and institutions. This is particularly pertinent for the rapid identification of contaminated food and the implementation of food recall procedures.

Commitment is required within governments/Member States to strengthen foodborne disease surveillance, and foodborne disease surveillance should be given priority in the development of food safety infrastructure.

There is a need for rapid identification and response to outbreaks of foodborne diseases with regional and international health implications, and there is a need to integrate foodborne disease reporting into the revision of the WHO International Health Regulations.

There is a need to establish the burden of foodborne diseases and their relative impact on public health and economics. WHO should be proactive in establishing one or more sentinel sites for foodborne disease surveillance in developing countries.

4.2.3 Summary of Findings

Data generated by foodborne disease (FBD) surveillance contributes to the increasingly high priority of food safety on the public health agenda in many countries. There is a need to develop and to coordinate a global strategy to strengthen FBD surveillance at national, regional, and global levels. In particular, there is a need to build the capacity of developing nations to undertake foodborne disease surveillance and to apply the data obtained to risk management processes. To be successful, health surveillance and risk assessment experts need to collaborate more closely.

Development of foodborne disease surveillance should include:

- Development of a strategic plan for foodborne disease surveillance, in partnership with relevant stakeholders;

- Leadership in the development, expansion and coordination of regional and national laboratory and epidemiological networks for foodborne disease surveillance (such as Global Salm-Surv);
- Coordination of the establishment of sentinel foodborne disease surveillance sites in developing countries;
- Collaboration on foodborne disease surveillance between appropriate parties;
- Facilitating the building of laboratory and epidemiology capacity to support foodborne disease surveillance; and
- Developing mechanisms to use surveillance data in microbiological risk assessment, and to fill data gaps identified in the microbiological risk assessment process.

WHO should help to build the capacity of Member States to undertake surveillance and to apply data obtained from surveillance to prevent and manage foodborne risks.

4.3 Chemical Hazards Associated with Foods

4.3.1 Synopsis of Issues Presented

Chemical contamination of food occurs both locally and globally. However, in an era of globalization, even local food contamination problems can be of international significance. Adverse health effects can be caused by both short and long-term exposure to chemicals in food and include cancer, kidney and liver damage, harm to the unborn child, immunotoxicity, endocrine disruption, and a host of other effects.

While developed countries possess well-established systems for managing chemical hazards in food, they need to maintain and upgrade these systems to make them more responsive to emerging hazards. Developing countries remain poorly equipped to manage even basic food safety problems caused by chemicals. The increasing globalization of food trade has focused attention on food safety and its management through international standards set by Codex. Such standards form the basis of risk management of many chemical hazards in food. Participation in the development and the observance of these international standards contribute towards minimizing risks posed by chemicals in food.

The objective of WHO food safety initiatives in the area of chemical contaminants is to prevent human exposure to levels of chemicals in food that pose unacceptable risks to human health and to chemicals whose risks have not been adequately assessed.

The WHO Food Safety Programme must continue to play a leadership role in the development of methodologies and tools used in risk assessments of chemical hazards in food. It must also continue its leadership in the performance of risk assessments that provide the basis for the effective management of chemicals at both national and international levels. WHO must also be a strong advocate of food safety as the primary rationale for limiting chemicals in food through Codex standards and must be active in supporting capacity building of developing countries to assure that there is reasonable certainty of no harm from chemicals in food.

4.3.2 Issues Identified during Discussion

The discussion highlighted the importance of the identification of potential problems associated with the diet, including dietary supplements classified by Codex as foods

formulated for special dietary use. New technologies and foods may introduce chemical hazards into food that cannot be predicted. Initial anecdotal information, which is often on chemical hazards, needs to be linked to surveillance systems that can confirm such correlations, particularly at the international level. Codex could address the issue of safety associated with dietary supplements, coupled with risk assessments by WHO and FAO. Similarly, some novel foods have the potential to exert an adverse nutritional impact on health and therefore need to be addressed in a similar way. Medical or health claims associated with these new foods need to be validated and WHO may have a role in this process.

The issue of evaluating the effectiveness of risk management interventions to mitigate chemical risks was raised. Because the period between exposure to chemicals and effect may be long, it is likely that the direct measurement of impact of exposure to chemicals in food on health is often not feasible. A simpler evaluation measure is to look at the reduction in levels of chemical in food. In addition, biomonitoring for certain chemicals may serve as a better tool in evaluation studies. Monitoring programmes to evaluate risk management intervention would need to be conducted for an appropriate length of time.

Certain toxic endpoints are currently not adequately addressed in risk assessments, including immunotoxicity, endocrine disruption, and developmental toxicity including neurotoxicity. Methodologies need to be developed for assessing vulnerability and exposures of certain sub-populations such as infants, children, pregnant women and the elderly. Cumulative effects of chemicals with similar mechanisms of toxicity also need attention. Methodologies are also needed to address the additive effects of chemicals with similar mechanisms of action *e.g.* cholinesterase inhibitors such as organophosphate insecticides and carbamates, and to account for non-dietary sources of exposure. Methods for assessing acutely toxic chemicals and those that tend to bioaccumulate need to be developed. An improvement in the safety assessment capability would involve research on aggregate exposure to chemicals in food and risk assessment methodologies to take cumulative toxicity into account. Ecotoxicity coupled with monitoring for chemicals in the environment needs to be carried out. WHO should promote new techniques using an interdisciplinary approach, and rapid tests which focus on critical control points in the food chain may be useful.

WHO is in the process of addressing the issue of cumulative risk posed by exposure to multiple chemicals which operate through the same toxic mechanisms *e.g.* dioxins and dithiocarbamates. This necessitates both a hazard characterization which provides an evaluation of the relative potencies to cause the toxic effect *i.e.* toxic equivalence factors and an exposure assessment to take into account the intake of various residues in the food supply. WHO has completed the toxic evaluation for dioxins, dioxin-like PCBs, and dithiocarbamates (group of thyrotoxic fungicides). Exposure assessments have been completed for dithiocarbamates, and dioxins will be addressed at the next JECFA. A cumulative risk assessment for dioxins in breast milk has been completed.

WHO is developing hazard characterization methodologies for new toxic endpoints, such as immunotoxicity. For example, WHO has prepared an Environmental Health Criteria Document on assessing direct immunotoxicity and JMPR is using immunotoxicity studies as the basis for setting toxicological benchmarks *i.e.* ADIs. WHO and other international organizations continue to execute projects on developmental neurotoxicology, children's health risks, aggregate exposure assessment, and cumulative risk assessment, and literature on these topics is increasingly being made available.

It was proposed that there be closer collaboration between the United Nations Environment Programme (UNEP) and WHO and sharing of information with a view to improving risk assessments for chemicals in food in the context of international conventions

related to chemicals, such as persistent organic pollutants (POPs). The need to establish baseline data for contaminants was also emphasized. WHO should explore the potential value of sharing risk evaluations that are carried out by other national and regional agencies.

It was suggested that strategies for the prevention and control of chemical risks in food should recognize the cost-effectiveness of traditional production methods and should evaluate whether systems such as organic farming or other new methods of food production help to reduce current risks.

For chemicals deliberately added to food, such as food additives, pesticides and veterinary drugs, there is a global consensus that the best approach is to evaluate such chemicals for their safety before they are permitted to be added to food. Such a positive list provides the greatest protection for the consumer, but requires significant resources. Evaluation of chemicals added to food must continue to receive high priority by WHO, as this forms the basis of all Codex work in relation to chemicals.

Biomonitoring of contaminants such as dioxins in breast milk and ochratoxin A in blood, provide some of the most cost-effective means of assessing integrated exposure to certain contaminants. Such monitoring has been limited to developed countries, but should be extended to developing countries to obtain a global baseline assessment.

The Global Environment Monitoring System/Food Contamination Monitoring and Assessment Programme (GEMS/Food) has provided information on levels and trends of contaminants in food and the total diet since 1976. Most recently GEMS/Food has developed an electronic reporting system which is compatible with the WHO SIGHT website. SIGHT permits on-line access to the GEMS/Food database and allows users to obtain global contamination data presented in a consistent format. However, data from developing countries is scant and needs enhancement. The lack of such information suggests that consumers in developing countries are not protected against chemical risks.

Better consumption data need to be collected and methodologies for consumption surveys need to be developed to improve risk assessments.

Expert bodies used by WHO in risk assessments need to be seen as credible and their experts need a wider range of experience.

4.3.3 Summary of Findings

WHO should participate in the evaluation of risk management activities. It can do so by promoting the collection of adequate data on chemicals in food and comparing exposures over period of time to ascertain whether risk management measures have been effective in reducing levels of chemicals in food.

New methodologies and tools need to be developed, validated and implemented to improve risk assessments by JECFA and JMPR. This includes the expansion of the GEMS/Food database to 13 regional diets, the development of methodology for exposure assessments for contaminants, the development of capacity to estimate risks from cumulative exposure to chemicals in food (including chemicals with a common mechanism of action), the determination of acute reference doses for contaminants, the assessment of exposure for sub-populations, etc. This will enable Codex to provide a more accurate basis for risk management of chemicals in food.

The risk assessment for contaminants will be facilitated by funding toxicological studies on contaminants as well as contaminant concentration levels, especially in developing countries.

WHO should continue to improve its links with other international agencies, such as UNEP, involved in chemical risk assessments to improve its risk assessments and avoid duplication.

WHO should consider alternative approaches to maximize the collection of data on chemical contaminants. Sampling needs to better target high-risk foods.

WHO should consider a broader representation on its advisory bodies to assure a balanced and unbiased approach to risk assessment activities.

WHO should actively advocate and assist in the capacity building of developing countries, including assessment of exposure to chemicals as a part of a complete food safety system to assure safe food at the national and international level.

Potential chemical risks posed by dietary supplements may need to be addressed by performing risk assessments, including evaluation of potential adverse effects. Furthermore, WHO should examine its role in the validation of medical or health claims associated with novel and fortified foods.

WHO should strengthen its efforts to assist developing countries in obtaining health-oriented data on chemical contaminants in food and in the total diet to permit an assessment of the risks to their populations and to facilitate their participation in the international standard setting process.

4.4. Biotechnology and its Application to Foods

4.4.1 Synopsis of Issues Presented

WHO has been active in the development of principles and recommendations for the safety and risk assessment of foods derived from biotechnology. The results developed in the course of various expert consultations form the basis for guidelines at the national level and are presently being incorporated into internationally recognized guidelines.

The approach based on the principle of *substantial equivalence* was developed for the safety assessment of the first generation of genetically modified (GM) crops and is felt by many to be an adequate approach. Nevertheless, the concept is subject to ongoing criticism. Contemporary activities have to take these arguments into account and contribute to the development of science-based adjustments and improvements. The latest FAO/WHO Expert Consultation has established substantial equivalence as a guiding step of a safety assessment, not a safety assessment in itself.

The next generation of GM foods will be crops with improved nutritional value, thus crossing the borderline to *functional foods* and *nutraceuticals*. Future food safety assessment strategies will have to cope with the more complex metabolic changes caused by the genetic modification. Evaluations will increasingly have to consider the impact of a GM food on the overall nutritional status taking into account the different needs in developed and developing countries.

Labelling of foods produced through biotechnology may or may not be related to food safety *per se*, but it is being seen as a tool to increase the transparency of food production processes. Such labelling may also foster the development of traceability strategies which could be seen to contribute to improving national food safety programmes.

4.4.2 Issues Identified during Discussion

Taking into account ongoing work of the *Ad Hoc* Intergovernmental Codex Task Force on Foods Derived from Biotechnology, and of the Codex Committee on Food Labelling, the development of generally accepted guidelines for the safety assessment of foods derived from biotechnology should continue to be a focus of WHO activities.

JECFA has already evaluated several food additives derived from biotechnology in response to the requests by Member States. There is a need for future consideration of other techniques in this area, *i.e.* an expansion of the relatively narrow focus on gene-technology should be considered.

The possibility of increased interaction with the biotechnology industry might be explored. This would facilitate the gathering of information about current and future developments which are associated with direct and tangible effects on quality of life. However, any activity in this area should be undertaken cautiously in order to maintain the credibility and independence of WHO.

The discussion on the application of recombinant DNA techniques could be used as an additional opportunity for the education of consumers on traditional procedures applied in the production of foods. However, the risk in traditional foods should not be used as an excuse or defense to justify the safety of genetically modified organisms (GMO). Public education on this matter should be pursued as an independent communication activity.

The development of GM foods with enhanced nutritional values may be a promising approach for the prevention of micronutrient deficiencies. Among the various options, developments in iron fortification using biotechnology techniques merits further attention. Such developments, however, should not impede governments from continuing to address micronutrient deficiencies using current approaches for dietary improvement, such as fortification and supplementation. In any assessment initiative, it is important that the WHO Food Safety and Nutrition for Health Development Programmes work jointly with FAO, UNEP, and other relevant international entities.

4.4.3 Summary of Findings

WHO has been actively participating in the development of principles and recommendations for the safety assessment of foods derived from biotechnology. The information collected during various expert consultations forms the basis for guidelines and is presently being incorporated into internationally recognized standards.

The development of guidelines for the safety and risk assessment of foods derived from biotechnology should continue to be a focus of WHO activities. Some future issues to be considered in relation to WHO involvement in foods derived from biotechnology include:

- Assessment of new analytical methods (e.g. profiling techniques - genomics, proteomics, metabolomics) as tools for compositional analysis of GM crops;
- Coordination of activities to enlarge the knowledge (databases) on natural variations in compositions of traditionally bred crops and to determine the *natural baseline*;
- Increased incorporation of bio-informatics as a food safety assessment tool;
- Development of early *in vitro* and *in vivo* bio-markers for toxicity;
- Nutritional evaluation of GM foods;
- Comprehensive intake assessment;

- Post-market surveillance strategies; and
- Environmental issues related to large-scale growing of GM crops.

Except in response to the requests of Member States, it was agreed in general that WHO should not routinely get involved in the assessment of individual foods derived from biotechnology, especially genetically modified food products. Safety and risk assessments of GMO have to be performed on a case-by-case basis by national regulatory authorities, taking into account circumstances specific to the country.

However, in the case of products with a potential health benefit mainly marketed in developing countries, where there could be a lack of sufficient expertise and capacity for safety and nutritional assessment, WHO could conduct an evaluation of these products, on an *ad hoc* basis. In such cases, the evaluation would include safety and nutritional assessment, and comparison of the cost-effectiveness and effect on poverty alleviation of the product with other approaches to achieving the health benefit. Such evaluations would have to be performed in close collaboration with other international partners, notably FAO and UNEP.

WHO will need to address future applications and issues associated with genetically modified food including:

- GM microorganisms, typically developed for optimization of fermentation processes or as probiotics (functional foods), their potential colonization of gastrointestinal tract, gene transfer, etc.
- GM animals and the management of ethical issues

The next generation of genetically modified foods will be crops with improved nutritional value, thus crossing the borderline to *functional foods* and *nutraceuticals*. Future food safety assessment strategies will have to cope with the more complex metabolic changes caused by the genetic modification. Evaluations will increasingly have to consider the impact of a GM food on the overall nutritional status taking into account the different needs in developed and developing countries.

WHO could consider what role it might play in directing the use of biotechnologies to better serve the public good. Any role it might play should be informed by a process involving broad public input and entail comparisons of the cost-effectiveness of the biotechnology application with other ways to achieve specific public health goals. As a part of this, the feasibility of strengthening the interaction with the biotechnology industry might be explored.

Labelling requirements in conjunction with traceability strategies can be used as tools to increase the transparency of food production processes and thus contribute indirectly to food safety in general. WHO should coordinate collaboration between developed and developing countries, in the field of detection methods.

WHO should continue to convene expert consultations to develop principles and methodologies for risk assessment, risk management, and risk communication associated with foods produced through biotechnology. It should do so jointly with FAO and other relevant organizations. WHO should convene regional workshops to convey these principles, and to assist in transforming them into a regulatory framework. WHO should review national regulatory programmes for compliance with WHO principles when requested by individual countries.

WHO needs to address the ethical aspects of foods derived from biotechnology.

WHO should use its regional infrastructure for technology transfer and local capacity building in biotechnology. WHO should support the development of a regional/national network on biotechnology, including a more prominent role for WHO Collaborating Centres, such as the WHO Collaborating Centre for the Health Impact of Biotechnology (located in the Netherlands). Such centres could assist in technical assessments and evaluations, the dissemination of information, and communication activities. Collaboration with FAO, OIE, UNEP, and other organizations should be further strengthened.

4.5 Regulating Food Safety

4.5.1 *Synopsis of Issues Presented*

Food safety must be viewed as a shared responsibility and include food producers and handlers at all stages of the farm-to-table continuum. The role of consumers is perhaps most important in that they are closest to the point of consumption. WHO should promote stakeholder involvement in regulatory development. Food safety laws and regulations establish legal responsibilities and limits, but these are of little value without enforcement. Effective enforcement that uses strategic interventions can be implemented even in developing countries and is an important issue for WHO.

Public health is the primary objective of food safety legislation. Openness and transparency, scientific excellence, and risk communication are essential ingredients in securing consumer confidence. WHO's role in food legislation should focus on science, education, technical assistance and international standards and guidance. Global food trade is presenting new challenges. Food safety problems need global science, global thinking, and global solutions.

Food safety legislation should be based on the principles that public health protection is paramount, and only safe and suitable foods may be marketed. Regulatory decisions should be science-based, and national authorities must have enforcement power. In its implementation, food safety authorities should be able to identify problems and take steps to deal with them. Regulation should be developed and enforced in a consistent, transparent and interactive manner with public and other stakeholder input. Authorities should choose strategies that will provide incentives for compliance.

WHO is positioned to disseminate advice on food safety control systems and on effective, affordable and practical approaches to Member States. The effective participation of developing countries, especially public health missions, in Codex should be a high priority. Because WHO resources are limited, support is needed from donors, including WHO Member States, Development Banks, Organization for Economic Cooperation and Development (OECD), private sector, and public-private partnerships. A strong relationship with FAO is vital.

4.5.2 *Issues Identified during Discussion*

Regulation is a key driving force for improving food safety but it needs to be accompanied by enforcement. Most countries have some regulatory framework, but it is often outdated or lacks certain essential components. To promote farm-to-table food safety, legislation should be reviewed to identify gaps in coverage. Many developing countries lack an integrated monitoring programme for domestic food and this may need to be incorporated into their legislation. Human and administrative capacities need to be strengthened. WHO might assist in establishing regulatory-based food control infrastructure. WHO activities at the national level have focused on the health care system, but more attention should be

given to strengthening food safety systems. WHO needs to enter into partnerships with donors to accomplish this. Development banks, Member States, and United Nations Development Programme (UNDP) should be considered among others as potential donors for programmes to support food safety legislation and enforcement.

Models or templates of modern food law and some guiding harmonized principles applicable to basic food safety regulation would be useful for regulators in developing countries. The FAO/WHO "Guidelines for Developing an Effective National Food Control System" (1976) remain the only definitive guide, and is in urgent need of updating. Taking into account ongoing work in the Codex Committee on General Principles, these guiding documents may also consider how to address precautionary approaches and social issues that impact on legislation. For example, reasonable certainty of no harm is a possible level of protection that might be considered in legislation. Consumers would prefer proactive and preventive measures, such as the HACCP system, for food safety control. Hence the approach should reflect a prevention, corrective action and enforcement philosophy rather than direct enforcement alone. For example, HACCP can be an effective preventative strategy, as opposed to end-product enforcement. Therefore a broader concept of food safety control should be envisaged. Economic, political and social problems in developing countries currently provide disincentives to enforcement. These countries need tools, such as cost-benefit analyses to demonstrate benefits and incentives for enforcement of existing legislation.

The emerging issue of dietary supplements might be addressed within legislation, but advice from WHO on the status and safety evaluation of such products would be useful. In addition, information on good manufacturing practices for their production is needed. WHO should assist in the development of systems and the building of capacity to undertake pre-market evaluation for dietary supplements, novel foods, and nutraceuticals.

The proposed FAO/WHO Global Forum on Food Safety will allow the exchange of national experiences in food safety management. It will provide an opportunity to better understand food safety regulation as practised by individual countries, and particularly how it is adapted to each country. Developing countries need to be present at the Forum, and funding to support their participation should be identified. The Global Forum needs to have clear focus. For example, a possible topic could be to examine the impact of Codex at the national level.

WHO has a primary mandate for public health that should be leveraged to promote food safety at the international level through different avenues. One of these avenues is the Codex Alimentarius Commission. Harmonization of Codex work within standard setting has more recently emphasized public health. However, delegations attending Codex meetings often do not include personnel with the appropriate technical background, and often do not represent health portfolios involved in national food safety issues. Other mechanisms for greater participation in Codex, such as webcasting, might be useful. Developing countries may be present at Codex, but this does not mean that they are effective in influencing the process. Ad hoc working groups of Codex that are only conducted in English do not facilitate participation of developing countries in the process. When comparing the requirements of Codex with those of the United States and the European Union, wide differences exist and advice on resolving these relative to the situation in developing countries, in particular, needs to be developed.

FAO expends significant resources on food safety and quality activities in developing countries, whereas WHO has had less resources to focus on food safety. It is essential that WHO clarify its legitimate public health role (including sustainable development and healthy settings) in regard to projects and programmes for strengthening food safety globally. Greater communication and partnership between WHO and FAO should be promoted at all

levels. A need for improved communication and collaboration among different sectors and disciplines was also expressed.

4.5.3 Summary of Findings

WHO should collaborate with FAO in all projects and programmes related to food legislation at a national level, and elaborate guidance materials for the development of basic national food safety legislation.

WHO in collaboration with FAO and other relevant organizations, should establish comprehensive education programmes in relation to food safety legislation and food regulation. In this area, WHO should coordinate both nationally and regionally the activities of other relevant organizations including NGOs in order to build synergy with their work.

WHO and FAO should proactively and vigorously promote and support effective participation of all countries in the work of the Codex. It is essential that developing countries, and in particular the health sector, participate in the Codex process.

WHO and FAO should convene a regular Global Forum for Food Safety Regulators with the purpose of exchanging information, approaches and experiences in food safety management. A desired outcome of this process would be increased public health protection through enhanced food safety, with food safety being placed higher on the political agenda of Member States. The forum should focus on specific matters, and its status and *raison d'être* reviewed regularly.

WHO, in cooperation with FAO and other international organizations, should take steps to ensure coordination among their strategies and activities relating to food safety.

WHO should promote a multisectoral approach in relation to providing regulatory guidance, involve consumers and other stakeholders in the preparation of food regulations, and encourage efforts to raise the competence of enforcement officers.

WHO and FAO should assume a leadership role in providing global scientific support to address risk and benefits of new and emerging issues related to food safety.

WHO should regularly evaluate the progress of international food safety efforts, and publish data on the impact of unsafe food on public health. The development of methods for assessing the effectiveness and efficiency of national food safety systems would be beneficial in identifying gaps and needs. Furthermore, there is an opportunity to fast-track the development of food safety capacity in developing countries, by not repeating the mistakes made in developed countries.

4.6 Risk Communication

4.6.1 Synopsis of Issues Presented

There is a need for a risk communication strategy covering food safety issues along the entire food chain and involving all stakeholders. There are likely to be differences in food risk communication needs, between countries, between different strata in a population, and according to the severity of the disease. Differences will reflect health concerns and risk perceptions held by the public in different countries or demographic groups, which may be related to differences in dominant value systems (e.g. environmental concern or perceived social exclusion), safety needs, perceived social inclusion in decision making, and trust in

institutions. It is, however, possible to develop a generic communication strategy that can take account of all these differences.

WHO is highly trusted by the community, and in a good position to drive risk communication initiatives within Member States. It is important to understand what is most appropriate in terms of the content of risk communication (particularly under conditions where there are benefits associated with a potential hazard), whether the information is disseminated in a *crisis* context or as part of an ongoing public interest information programme, and to utilize knowledge of local conditions to maximize information impact. For example, in developed countries, resources might be best focused on mass media delivery using various formats such as television news or the Internet. The use of community networks may be more appropriate in countries where access to technology is more limited. However, such networks may also be appropriate in developed countries where there is a need to involve excluded groups in the communication process.

Key drivers of such an information strategy were identified in the WHO/FAO expert consultation on food risk communication held in 1998². In addition, consideration needs to be given to how best to communicate risk uncertainty, understanding cross-cultural and intra-individual differences in risk perceptions and concerns, and obtaining increased public input into the development of such a strategy. In particular, it is important that technical risk is not the only driver of risk communication practice. If there is not a genuine effort to involve stakeholders, there may be problems if the recipients of the message believe their actual concerns or interests are not being addressed.

4.6.2 Issues Identified during Discussion

Any risk communication activity must address the specific needs of the target audience *i.e.* consumers, food industries, regulators, Member States, etc, and the manner by which WHO should transmit the message to this audience. Consumer education in food safety, in particular for primary and secondary school children and their teachers and physicians, is vital to ensure a reduction in foodborne disease.

To protect the credibility of WHO, it is essential that WHO enhances the transparency of all activities associated with expert advisory bodies *e.g.* JECFA, JMPR, JEMRA. While important steps have already been taken in this regard, there should be full disclosure and public dissemination on the internet of the interests of experts. In particular, the process of selecting experts should be reviewed.

Results of risk assessment should be disseminated to all stakeholders in a clear and lucid manner. WHO should be proactive in risk communication, and perhaps study methods used in Member States and utilize proven risk communication tools and examples. Risk communication should not be considered as a substitute for risk prevention measures.

It is important to engage in risk communication efforts even though enough data for a final risk characterization may not be available. Efforts should be continually made to update and include new information about the risk. Communication and education about the concept and consequences of risk uncertainty should be considered as a priority in the risk communication process, and new ways of explaining such uncertainties at different technical levels should be sought.

Special assistance on risk communication strategies may be needed for developing countries.

² Joint FAO/WHO Expert Consultation (1998). *The application of risk communication to food standards and safety matters*. FAO Food and Nutrition Paper, No. 70. Rome, 2-6 February 1998.

Improvements in communication between risk assessors and risk managers are needed.

4.6.3 Summary of Findings

WHO is well positioned in terms of public trust to develop and implement a food risk communication strategy.

WHO should identify food safety risk communication needs in different Member States and specific demographic groups in order to maximize the effectiveness of risk communication efforts.

Risk communication needs to address:

- Clarity about the risk, including facts and uncertainties;
- Public concerns about technical assessment difficulties;
- Crisis responsiveness and rapid alert mechanisms;
- Rapid provision of information to all stakeholders and full social inclusion;
- Trust in institutions;
- Communication of uncertainty, and increased transparency in risk management processes; and
- Problems associated with trans-boundary risk communication issues.

WHO should develop a generic communication strategy based on the 1998 FAO/WHO expert consultation on risk communication, taking into account local differences and information needs. This should include inputs from regional and country offices and information gathering from research programmes.

The effectiveness of Risk Communication programmes and their implementation should be assessed, insofar as is possible, by:

- Impact on and improvements in public health;
- Changes in risk perceptions; and
- Economic indicators.

Constant refinement of the risk communication message and process, following feedback from evaluation activities, is essential.

Exploitation of multiple delivery mechanisms is important, and should be established according to local conditions. This may include electronic media, community networks, network cascades e.g. through Non Governmental Organization activities, and exploitation of institutional networks. WHO should provide advice on the benefits and costs of the alternative delivery mechanisms.

The special questions of risk communication between risk assessors and risk managers should be further elaborated (a preliminary approach has been suggested in the Kiel 2000 report³ on risk assessment-risk management interaction).

³ WHO (2000). *The interaction between assessors and managers of microbiological hazards in food*. Report of the WHO Expert Consultation (WHO/SDE/PHE/FOS/00.7). Kiel, Germany, 21-23 March 2000.

4.7 Developing Food Safety Capacity

4.7.1 *Synopsis of Issues Presented*

Capacity building represents all those activities that seek to develop food safety capability in Member States. In the context of WHO, this includes those actions where the output of WHO's normative function are communicated and implemented in Member States.

The motivation for capacity building is to reduce the risks associated with foods, decrease the incidence of foodborne disease, and to raise food safety as an important and manageable public health issue. Building capacity has the added advantage of facilitating the involvement of developing nations in global food trade.

The form and function of capacity building ranges from advocacy activity, through to technical collaboration with Ministries of Health (and other national agencies) in Member States, including human resource development. It seeks to resolve deficiencies including the absence of national food safety plans; outdated laws and regulations; absence of foodborne disease surveillance; poorly resourced and structured food inspectorates; and the lack of education and training materials in food safety.

With many countries lacking an effective food safety system, the objective of WHO input into capacity building should be to assist in the creation of efficient and sustainable food safety control programmes at the national level.

The WHO strategy should be based upon leadership in and advocacy of a food safety agenda. At the national level it should be underpinned by an assessment of needs, which leads to technical input into specific operational activities and interventions. Successful capacity building needs commitment and input from Member States.

4.7.2 *Issues Identified during Discussion*

Capacity building is a very important factor in achieving the goal of reduced foodborne risk in all regions of the world. The allocation of additional funds to support food safety activity at regional level would reflect WHO commitment to capacity building.

There must be balance between normative activities and capacity building activities for food safety within WHO. The demand for technical assistance by individual nations has increased in the context of the SPS agreement since 1994. Coordinated collaboration with donor countries and agencies involved in capacity building at a national level is vital to reduce duplication of effort.

Capacity building must start with a needs assessment to ensure that capacity building activities are customized to the specific needs of the Member State. The components of a national food safety programme must contain all those elements (legislation, risk assessment, enforcement, foodborne disease surveillance, food monitoring, basic hygiene, and communication) necessary to build a comprehensive system.

The building of capacity for food safety has many players at a national level, including the health, agriculture, trade, and commerce sectors. It is essential that capacity building is based upon collaboration and coordination between these national partners. Specifically, national governments should take a more prominent role in the coordination of capacity building activities (including training and structural improvement) amongst its agencies and provinces, to prevent duplication of effort and maximize resources. It was suggested that the health portfolio should take the lead agency role at the national level.

WHO has an important role in capacity building because of the widespread perception of its neutrality, independence, and credibility. For this reason it needs to take a leadership role in coordination of food safety capacity building activities. It was suggested that WHO's role in capacity building is to: coordinate, facilitate, and advocate capacity building and to act as a broker for international donor and aid agencies. There is a huge potential for WHO to collaborate with development banks, donor agencies, and bilateral organizations to secure funds. WHO needs to update its administrative procedures and culture of fund-raising in order to participate more efficiently in the generation of new development funding in relation to food safety. WHO should investigate more innovative approaches to attracting and managing external financial support for food safety programmes in Member States.

In some situations, international agencies, donor countries, and aid agencies participate in capacity building in a single country in an uncoordinated way. It was suggested that WHO/FAO could undertake joint missions into countries to identify needs and plan for capacity building activities.

Training of human resources remains an important component of capacity building. The WHO Collaborating Centres and FAO Regional Centres of Excellence could be better utilized in areas such as human resource development, foodborne disease surveillance, laboratory techniques, etc. These centres could be used to assist in coordinating food safety activities in the regions, and could be used more innovatively to achieve food safety goals. Some members felt that currently these centres are not well utilized or supported. The most important resource in capacity building at the national level is the development and utilization of human resources.

The initiation of a system of regional collaborating centres for training in food safety related disciplines could be expanded to include the generation of regional data pertinent to national and international food safety initiatives. WHO could assist in the establishment of networks of research institutes and universities, with their facilities and human resources utilized to provide data for national and regional food safety activities.

It was suggested that Regional Offices should strengthen their function and staffing in food safety. Success in capacity building is predicated on strong involvement from the regional office; a continued in-country presence of staff (Regional Office and Country Office), and the building of strong links between health and other Ministries at the country office.

Capacity building in food safety needs to be driven primarily by health issues, rather than specific trade issues and their economic impacts. This will ensure that the health of local people in the food exporting developing countries are protected as well as health of consumers in the importing countries.

There is a clear need to evaluate the performance and success of capacity building activities.

It was suggested that an international conference including all public health authorities involved in food safety should discuss capacity building and give encouragement to developing nations to place food safety prominently on their country's public health agenda. It was also noted that the proposed Global Forum for Food Safety Regulators could assist developing countries to build significant food safety capacity in the domain of food regulatory infrastructures, safety systems and strategies.

4.7.3 Summary of Findings

Capacity building is a vital component of any strategy to achieve the goal of reduced foodborne risk in all regions of the world

Capacity building endeavours must be preceded by a needs assessment to ensure they meet the developmental needs of the country.

WHO needs to play a leadership role in the promotion and coordination of capacity building activities in food safety at a national level to avoid duplication and maximize the utilization of resources.

WHO should promote the development of sustainable capacity and evaluate its capacity building performance in terms of quality and cost effectiveness.

WHO should continue to advocate the increased priority of food safety as an essential public health function and to increase its collaboration with Member States in developing infrastructure and capacities consistent with a risk-based approach. In this effort, WHO should consider additional food safety staff at the Headquarters, Regional Office, and WHO Country Office levels. In particular, WHO Regional Offices should strive to strengthen their function and staffing in food safety, and further progress the development and implementation of regional food safety strategies.

Because resources are needed to build capacities for food safety infrastructure in developing countries, it is recommended that WHO explore the possibility of mobilizing extrabudgetary resources from development banks, United Nations development agencies, Member States and other multilateral and bilateral donor agencies. The drafting of memoranda of understanding with potential partners will facilitate this process. In this arena, WHO should take the lead, promoting and supporting public health aspects of food safety (as distinct from agricultural and trade aspects) at the national, regional, and global levels to optimize the use of resources.

5. CONCLUSIONS AND RECOMMENDATIONS

The World Health Assembly recognized food safety as a priority area in May 2000 reflecting global concerns that food safety is an essential public health function. The Director-General was requested to convene a Strategic Planning Meeting of food safety experts to provide the Food Safety Programme and WHO with strategic advice on various global food safety issues.

The development of a strategy to reduce the burden of foodborne disease requires:

- an understanding of the level of food safety, at national and international levels;
- a judgement of the acceptable level of food safety to be achieved;
- an understanding of obstacles that prevent improvements in food safety;
- an agreement on approaches to removing these obstacles; and
- a feedback mechanism for performance evaluation and strategy refinement.

The material presented here documents the overarching conclusions of the Strategic Planning Meeting. Information gathered during the meeting was then employed during the drafting of a *Global WHO Food Safety Strategy*.

5.1 Fostering Improvements in Food Safety

Ideally, food safety programmes, risk assessment, and foodborne disease surveillance activities should encompass the entire food chain to the limits of contemporary data and technology. However, the magnitude and complexity of the task needs to be taken into consideration. In developing strategic advice it is essential that WHO identify any potential gaps in implementation, that priorities are set, and that the effectiveness of implementation is monitored.

Recommendation 1

It is recommended that WHO work more closely with FAO, UNEP, and all other relevant partners by creating multidisciplinary food safety networks at all levels, including in Member States, to promote the farm-to-table approach to food safety. Strategies to improve food safety should be subject to periodic audit and review.

It was agreed that a risk-based approach embedded in the FAO/WHO risk analysis framework be adopted for determining priorities and activities in the WHO food safety strategy. Risk analysis was recognized as the primary tool for decision-making and was considered to be particularly useful for emphasizing the importance of human health outcomes, and identifying gaps in knowledge, data, and infrastructure. However, it was acknowledged that different risks may require different strategies. A modular approach to risk analysis was thought to offer many advantages in terms of implementation of food safety strategies.

Recommendation 2

It is recommended that the FAO/WHO risk analysis framework (including risk assessment, risk management, and risk communication components) be used

in the implementation of food safety strategies, and that a modular approach to risk analysis be followed.

It was recognized that a fundamental component of WHO's success in progressing food safety initiatives is the trust that all agencies and in particular, consumers, currently place in the expertise, independence, and credibility of WHO.

Recommendation 3

It is recommended that every effort be made to protect the trust placed in the work of WHO and to safeguard its credibility in the global community.

It will be necessary for some stakeholders to change their way of thinking or their belief systems to deal with the evolution of food safety systems. These difficulties should not be underestimated, hence it is vital individuals maintain an open mind and not block progress.

Recommendation 4

It is recommended that mechanisms to achieve effective discussion of diverse opinions on food safety issues are explored. Such mechanisms must maintain respect and not stifle debate.

Any assessment of the effectiveness of risk-based food control systems demand clarity in how we measure and express the burden of illness and the concept of food safety. It was agreed that WHO should continue to work to formalize and expand the discussion on acceptable levels of risk, specifically in relation to tolerable and acceptable levels. WHO should introduce clear descriptions of the principle of lowering risk in relation to food safety risk management activities. Every responsible party along the food chain *i.e.* producer, processor, vendor, etc should lower risk to the full extent achievable and continue to lower the risk as technology improves.

The participants discussed the need for WHO to reach agreement on how to determine and express the performance of food safety control systems. Clearly a major measure is the burden of foodborne disease in the community. Therefore a successful food control programme should result in a measurable reduction in the occurrence of foodborne disease. In this way, the level of safety for a given food may be documented and continually improved, in order to achieve the maximum risk reduction. This data may also be used to inform consumers and other stakeholders, and highlight food safety within the political agenda.

Recommendation 5

It is recommended that food safety priorities are identified from risk assessments and risk estimates based on data from the surveillance of foodborne illness combined with epidemiological studies. The relationship between foodborne disease and risk management measures should be investigated, employing surveillance systems to measure the burden of disease.

5.2 Scientific Needs

The risk-based approach embedded in the FAO/WHO risk analysis framework demands data and advice of the highest quality, such as that provided by expert bodies. The consultation agreed that more scientific effort should focus on the process of microbiological hazard identification.

Recommendation 6

It is recommended that networks be set up to collate the data derived from surveillance of all aspects of food handling and foodborne disease from farm-to-table.

There is an urgent need to identify supra-national or global microbiological hazards such as *Salmonella*, *Shigella*, or cholera to ensure the selection of the most appropriate pathogen-commodity combination for future microbiological risk assessments.

Recommendation 7

It is recommended that WHO take the lead in identifying globally relevant hazards and promotes the inclusion of these hazards in the priorities for international or regional risk assessment activities.

Concomitantly, there is an equal need to identify local hazards in order to facilitate the implementation of food safety systems at the local level, particularly in developing countries. Leadership is necessary to encourage consistent approaches to the collection and reporting of consumption data.

Recommendation 8

It is recommended that WHO collaborate with FAO in promoting the collection of food consumption data at the national level, including frequency of consumption, portion size data, and population variability.

The meeting believed that there are deficiencies in the scientific tools available for microbiological and chemical hazard identification. For example, it is very difficult to identify those hazards where there is a time lag between ingesting the hazard (cause) and the disease (effect) manifesting itself. Data is also often unavailable or very poor for many contaminants. Information is also lacking for prions, health consequences of exposure to combinations of chemicals, safety aspects of new technologies, functional foods and dietary supplements. Furthermore, it is difficult to identify potential hazards in the absence of evidence of harm. A case in point is the potential hazards that may arise from new technologies such as foods derived from genetically modified organisms.

Recommendation 9

It is recommended that WHO stimulate research and discussion as to how the science underpinning hazard identification may be further developed.

The participants discussed emerging microbial hazards, including those due to the development of antimicrobial resistance, the appearance of newly recognized pathogens, and innovations in technology and food science. The development of new methods and improved data collection activities is essential. For example data on antimicrobial usage would enable WHO and Member States to better address emerging hazards with antimicrobial resistance.

Recommendation 10

It is recommended that WHO promote the development of new methods, such as genomic analysis for the early detection of new pathogens, and encourage improved data collection activities.

5.3 Implementation of Change

The implementation of food safety systems, particularly the development of food safety legislation requires greater global coordination and cooperation. The participants emphasized the need for a preventative approach along the whole food chain, supported by corrective actions and enforcement. These approaches need to be supported by appropriate infrastructures.

Recommendation 11

It is recommended that WHO develop guiding principles to highlight best practice in the implementation of food safety legislation and other controls, and provide training, and establish networks to promulgate these best practices. As a part of this process, it is recommended that there should be an audit of food safety legislative controls and the level of enforcement in Member States.

Improvements in food safety impact directly on public health, so guidance in best practice must seek to progress public health goals.

Recommendation 12

It is recommended that a Global Food Safety Forum be held to share best practices and experiences in implementing food safety controls and achieving public health goals.

The participants discussed the need for more effective participation in the Codex standard setting process by developing Member States. In particular, the capacity and resources to send appropriate Public Health personnel to Codex Committees and the ability to collect and analyze data that underpin risk assessments were lacking in many developing countries.

Recommendation 13

It is recommended that WHO, in cooperation with FAO and concerned agencies, pursue efforts to ensure the fullest and most effective participation of developing countries in the Codex Alimentarius Commission and its subsidiary bodies, and that WHO play a greater role in Codex to ensure public health concerns continue to be paramount to the work of Codex.

Where possible, countries should implement risk-based programmes as a means of determining food safety priorities and implementing food safety programmes. Countries could adopt other risk mitigation interventions such as labelling, traceability, recall procedures, and education strategies. WHO should assist Member States to decide on food safety priorities and risk management options when they undertake capacity building activities.

However, capacity to perform risk assessments and to monitor foodborne disease by local sentinel studies should be developed as soon as possible to enable Member States to prioritize food safety risks. The complexities faced by those wishing to implement food safety control systems demand that an integrated, interdisciplinary approach be adopted. This requires the promotion of teamwork between all stakeholders in the food chain, including veterinarians, primary producers, industry, consumers, public health officials and other government agencies. There is also a need for all levels of government to work together: national, provincial, and local. Additionally, expert advice should be pulled together by agencies such as WHO and FAO, as well as WTO, to combine international expertise in trade issues with expertise in the food safety area.

Recommendation 14

It is recommended that sentinel sites for combined epidemiological and laboratory surveillance be established to maximize national, regional and international capabilities. Likewise, regional centres for risk assessment capacity building should be considered.

The meeting agreed that capacity building is a vital activity and a priority for WHO. Capacity building should be based upon an evaluation of the needs of an individual country and specifically tailored to address those needs. This will be further enhanced by the setting up or strengthening of Regional Laboratories to provide facilities for staff training, expert analysis, and data generation and this will support the measurement of public health outcomes. There is an urgent need for assisting developing countries in the areas of laboratory accreditation, analytical quality assurance, usage of test materials, development of reliable analytical methods, and use of reference standards.

Recommendation 15

It is recommended that WHO make capacity building of food safety systems a priority. WHO should work with other agencies to promote collaboration in capacity building activities, and the development of information on cost-savings and social benefits of food safety measures.

5.4 Risk Communication and Stakeholder Involvement

Regulators need to be convinced of the economic, social and political value of enforcing food safety legislation and involve stakeholders in the process of standard setting.

Recommendation 16

It is recommended WHO encourage countries to involve consumers and other stakeholders more fully in the process of setting up food safety control systems.

The participants agreed that the development of an effective risk communication strategy is absolutely critical to the success of WHO food safety initiatives. Data relating to the most effective way to develop risk communication interventions, which take account of local conditions, should be analyzed in order to maximize the effectiveness of the strategy.

It is also essential to develop systems for rapid alert in crisis conditions and for dissemination of reliable facts and information on uncertainties. An essential component of this strategy should be to engender the trust of all stakeholders, particularly consumers, to facilitate wider consultation and participation in risk management decisions. This includes representation of all stakeholder groups and relevant academic disciplines in the selection,

appointment and conduct of expert committees. WHO should develop and disseminate messages regarding controversial risk issues where national institutions, or industries, are not perceived to be independent and credible risk information sources.

An effective risk communication strategy was not seen as a substitute for a preventative approach to food safety, the two approaches are complementary.

Recommendation 17

It is recommended that WHO develop a risk communication strategy for food safety, building on to the recommendations of the report of the 1998 FAO/WHO expert consultation on risk communication. Any such strategy should take account of public concerns as well as the results of technical risk assessments.

LIST OF ABBREVIATIONS

ADI:	Acceptable Daily Intake
ALOP:	Appropriate Level of Protection
CCFH:	Codex Committee on Food Hygiene
FAO:	Food and Agriculture Organization of the United Nations
FBD:	Foodborne disease
GEMS/Food:	Global Environment Monitoring System/Food Contamination Monitoring and Assessment Programme
GM:	Genetically Modified
GMO:	Genetically Modified Organism
HACCP:	Hazard Analysis and Critical Control Point System
ICD:	Industry Council for Development
ILSI:	International Life Science Institute
JECFA:	Joint FAO/WHO Expert Committee on Food Additives
JEMRA:	Joint FAO/WHO Expert Meeting on Microbiological Risk Assessment
JMPR:	Joint FAO/WHO Expert Meeting on Pesticide Residues
NGO:	Nongovernmental Organization
OECD:	Organization for Economic Cooperation and Development
OIE:	Office International des Epizooties
PCBs:	Polychlorinated Biphenyls
POPs:	Persistent Organic Pollutants
PTWI:	Provisional Tolerable Weekly Intake
SPS:	Agreement on the Application of Sanitary and Phytosanitary Measures
UNDP:	United Nations Development Programme
UNEP:	United Nations Environment Programme
WHA	World Health Assembly
WHO:	World Health Organization
WTO:	World Trade Organization

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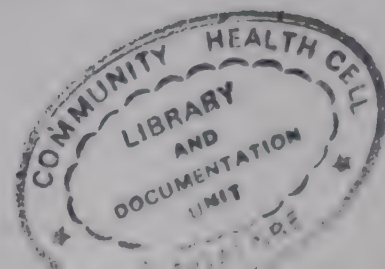
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